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REPORT
OF THE
BOARD OF COMMISSIONERS
OF THE
GEOLOGICAL SURVEY OF PENNSYLVANIA.
FOR 1885 AND 1886.

*To the Honorable Senate and House of Representatives
of Pennsylvania:*

The Board of Commissioners of the Geological Survey of Pennsylvania respectfully present the following report, January 1, 1887:

PROGRESS OF FIELD WORK.

In 1885 field work was continued in conformity to the act of July 3, 1885, as follows:

1. In the oil and gas regions, extending from McKean county on the north to Greene county in the south-west corner of the State, examinations in the oil pools were extended beyond the limits of the producing areas; a map of western Pennsylvania showing the outlines of the oil and gas pools was constructed; special investigations were made as to the relative positions of the different sands producing gas; the depth of the oil and gas sands below the surface in different parts of the region; and finally a general investigation was made as to the pressure, quantity, composition, and fuel value of the natural gas in the Pennsylvania regions.

2. In the Pittsburgh and Monongahela valley bituminous regions a revision of the surveys of the entire district was commenced; the prominent anticlinals and synclinals were

traced; and a special map was constructed, exhibiting the structure of the Pittsburgh coal bed between Monongahela City and Port Royal on the south, and McKeesport on the north.

3. In the Anthracite coal fields the surveys were extended in Columbia and Northumberland counties west from Mount Carmel; in Luzerne county south-west from Nanticoke; in the vicinity of Pittston in Luzerne county, and between Scranton and Carbondale in Lackawanna county.

4. In addition to the above, the following surveys were completed: (*a*) The coal beds and fire-clays of the Wellersburg basin in Somerset county; (*b*) The Tipton Run coal basin in Blair county; (*c*) Cornwall iron-ore mines, Lebanon county; (*d*) Brandywine Summit kaolins in Delaware county; and, (*e*) a survey of the Loyalsock coal basin in Sullivan county.

5. Since July, 1885, the State Geologist has been occupied in the preparation of a final report or summary of the geology of the whole State. Work on this report has only been interrupted by the time required for a general supervision of the field and office work and publications of the Survey, the details of which have been directed by the Geologist in Charge.

In 1886 the work of the Survey was continued as follows:

1. The oil and gas region surveys were enlarged, special attention being devoted to the oil and gas districts in Washington and Greene counties; a large number of valuable oil and gas well sections were collected; a new map of the oil and gas pools was constructed; and the statistics of the production and shipment of oil from the region since 1859 were collected.

2. In the Pittsburgh and Monongahela valley bituminous district, the revised survey was continued into parts of Westmoreland, Allegheny, Beaver, Washington, Fayette, and Greene counties; a new map was constructed of the entire district from recent surveys, to be published on a scale of two miles to the inch in the early part of the year; and an examination was made of approved methods of bituminous mining, which will be fully reported, with draw-

ings of tools, machinery, and special typical mine maps. Field work in this district is considered sufficiently complete.

3. In the Anthracite district the field surveys in the Western Middle coal fields in Columbia and Northumberland counties have been completed ; also those in the southwestern end of the Wyoming Valley in Luzerne county. A survey was carried across the entire region from Wilkes-Barre south to the Lehigh Water Gap. The surveys in the vicinity of Pittston have been enlarged ; and a new map of the entire Anthracite region has been constructed, showing the position of each individual colliery.

4. The survey of the iron ore beds in the Great Valley in Lebanon, Dauphin, Cumberland, and Franklin counties has been continued and will be completed during the spring of 1887.

5. The map of the Philadelphia Water Department, exhibiting its topographical surveys, covering 460 square miles in Bucks and Montgomery counties, has been reduced and prepared for publication, on 12 sheets, for the Atlas of Bucks and Montgomery counties, Part I.

PROGRESS OF PUBLICATION.

In 1885 were published the following :

1. Statistics of Production and Shipment of Anthracite coal for 1883 and 1884.

2. Report on Delaware County, C⁵.

3. Report on Perry County, F².

4. Report on Cameron, Elk, and Forest Counties, R².

5. Report on Huntingdon County, T³.

6. The Geological Atlas of Counties, X.

7. Annual Report of the work of the Survey for 1885.

8. The Atlas of maps and sections to illustrate the Annual Report for 1885.

9. Additional sheets of maps and sections in the Atlas of Eastern Middle Anthracite Field, Part I ; and

10. A map of the Oil and Gas Regions.

Three additional sheets of the topographical map of the

South Mountains, in York and Adams counties, have been printed.

In 1886 were printed statistical charts of the production of the oil regions and other maps to accompany the Annual Report for 1886; also additional sheets of the Anthracite Survey.

All reports of the Survey in the custody of the Board of Commissioners, stored at Harrisburg, have been distributed to the members of the Legislature for 1885, in accordance with the provisions of the act of July 3, 1885, and, therefore, in consequence of the operations of that law no copies of reports, now remain in the custody of the Board for general distribution to the public.

WORK REMAINING TO BE DONE.

The reduction of the appropriation, far below the amount asked for by the Board, at the last session of the Legislature prevented the completion of work in various parts of the State; so that there still remains unaccomplished the following:

1. To complete the series of colored geological county maps, on a scale of two miles to the inch, there are still wanting: Somerset, Cambria, Blair, Mifflin, Juniata, Union and Snyder, Lebanon, Schuylkill, Carbon, Lackawanna, Berks, Montgomery and Bucks counties. Only uncolored maps of Somerset and Cambria have been published with the respective reports of those two counties. Blair county is nearly all included in the large geologically colored map of the Morrison's Cove region. Parts of Mifflin, Juniata and Union (uncolored) are to be found described and locally mapped in various reports. Lebanon requires very little work. The northern part of Lackawanna, the eastern half of Berks and the southern third of Montgomery and Bucks have been already published on the colored county map-sheets of the adjoining counties, in the printed reports of the same.

2. No full geological reports have yet been prepared of Mifflin, Juniata, Snyder, Union, Franklin, Cumberland,

Dauphin, Lebanon and Schuylkill; and of parts of Carbon, Berks, Montgomery and Bucks counties.

3. Some local work must be done before the large geological and topographical map of the Conemaugh region, extending from the Johnstown Gap to Greensburg, and from Indiana to Latrobe, in Indiana and Westmoreland counties can be published.

4. Special surveys in the Bituminous coal fields.

5. Continuation of the surveys in the oil and gas regions.

6. Only one half of the detailed survey of the Broad Top coal region in Bedford and Huntingdon counties has been finished.

7. Special surveys are required of the middle line of the Cumberland Valley in Lebanon, Dauphin, Cumberland and Franklin counties, and of the north-eastern border of York.

8. A detailed mineralogical survey of the South Mountains in Cumberland, York, Franklin and Adams counties (for which we now have a perfect map basis) is to be made.

9. Special local surveys in Chester and Delaware counties are required.

10. A geological survey of middle and northern Bucks and Montgomery counties remains to be made on the basis of the Water Department map.

11. The continuation of the survey of the Anthracite coal fields, which at present is only about half completed, no work having been done in the other half. The Survey of the Anthracite region was not commenced until the surveys of the Bituminous region were nearly completed, so that there remains more work to be done in the Anthracite coal fields than in any other section of the State.

12. The completion of the summary report of the geology of Pennsylvania by the State Geologist (now more than half prepared) will require some examinations for special localities.

13. The Laboratory of the Survey at Harrisburg (closed in 1883 for want of funds) should be reopened for the determination of mineral specimens.

14. The topographical work of the Survey, which has always been carried on in districts in which it was indispensi-

ble for the understanding of the geology, and which covers already about 4,000 square miles, should be continued.

15. Accurate mineral statistics of Oil, Gas, Iron, Bituminous and Anthracite Coal, Limestone, Building Stones, Clays, etc., should be published by the Geological Survey, which has the requisite knowledge and intimate personal correspondence necessary for their accurate preparation.

RECOMMENDATION.

In view of the above statements, the Board of Commissioners recommend an appropriation of \$90,000 for the next two years ; one half to be expended each year in continuing the various work of the Geological Survey as above proposed, for which sum most of the work above mentioned can be completed, with the exception of the Anthracite Survey.

Respectfully submitted.

WILLIAM A. INGHAM,
Secretary of Board.